

Questions (Machine Elements part)

1. Enumerate the functions of springs. Give examples.
2. Classify the springs by comparison between external load and main stress (internal load). Explain and comment.
3. Define and explain the spring characteristics. Give examples.
4. Explain the variation of characteristics of the helical springs for extension. Give examples and comment.
5. Define and explain the spring energy factor (utilization factor). Give examples.
6. Define and explain the spring efficiency. Explain on the example from laboratory paper with rubber spring.
7. Calculate the spring constant of elastic system in case of joining springs in series. Explain and comment.
8. Calculate the spring constant of elastic system in case of joining springs in parallel. Explain and comment.
9. How is defined the spring index in case of helical spring ? Which is the range of regular values ? Explain and comment.
10. Which is the correction factor in case of helical spring ? Explain and comment.
11. Which is the effect of end treatment of the coil in the case of helical spring ? Explain and comment.
12. Which are the differences between helical springs and spiral springs ? Explain and comment.
13. Which are the differences between disk springs and ring springs ? Explain and comment.
14. Give few applications of torsion bar springs. Which are the advantages of such a spring ?
15. Give few applications of helical springs. Which are the advantages of such a spring ?
16. Which are the main thread cross-section forms ? Identify the main dimensions.
17. Identify the main dimensions and characteristics of a thread. Give examples.
18. Which is the difference between single thread and multiple thread ? When is used left-hand thread ?
19. Give on a draw an example of notation of a Metric thread in case of a bolt. Explain and comment.

20. Give on a draw an example of notation of a Metric thread in case of a nut. Explain and comment.
21. Identify the main dimensions and the parts of a bolt/screw. Give examples.
22. Identify the main dimensions and the parts of a nut. Give examples.
23. Which are differences between a bolt and a screw ? Exemplify.
24. Which are differences between a stud and a set screw ? Exemplify.
25. Draw an assembly between 2 parts with a screw in a blinded threaded hole made in one of the parts. Explain the rules used in the drawing.
26. Draw a bolt-and-nut assembly between 2 clamped parts. Explain the rules used in the drawing.
27. Sketch a screw mechanism with rotating screw and translating nut. Explain the functioning principle and give an example of using of it.
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30. Sketch a screw mechanism with rotating screw and translating screw. Explain the functioning principle and give an example of using of it.
31. How much is the amplification factor of a thread. Explain the phenomena.
32. Which are the components of total torque at wrench ? Explain and comment.
33. Which is the main factor of decreasing the efficiency of thread assembly ? Explain and comment.
34. Enumerate 3 methods of increasing the efficiency of a thread assembly. Explain and comment.
35. How much is the assembly stiffness in case of using unconfined gasket ? Explain and comment.